DOCUMENT RESUME

ED 262 384 CS 008 174

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TITLE Does Prior Knowledge Affect College Students' Performance on a State Developed Reading Competency Test?
PUB DATE 25 Oct 85
NOTE 17p.; Paper presented at the Annual Meeting of the College Reading Association (29th, Pittsburgh, PA, October 24-26, 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Basic Skills; College Freshmen; Comparative Analysis; Higher Education; *Metacognition; Minimum Competency Testing; Perception; Performance Factors; *Prior Learning; *Reading Improvement; *Reading Research; Reading Skills; Test Use; *Test Wiseness

ABSTRACT

Using 33 college freshmen enrolled in a basic reading skills course as subjects, a study was conducted for two purposes: (1) to determine the effects of direct exposure to the topics of the selections in the New Jersey College Basic Skills Placement Test (NJCBSPT) on their posttest scores, and (2) to investigate whether students exposed to the topics would indicate awareness of this knowledge on a teacher-made measure--the Prior Knowledge Inventory (PKI). The students were divided into two groups, randomly designated as the experimental and control group. Both groups, taught by the same instructor, received the same syllabus with the same required texts and quizzes. The experimental group received articles on the topics of the NJCBSPT; to control for the Hawthorne Effect the control group also received supplementary articles, similar in length and format, but unrelated to the test topics. During the last week of class, both groups were given the PKI. Results indicated that the experimental group did not do significantly better than did the control group. However, while the treatment variable did not affect the results, the reading program for both groups did show significant positive results. The total group went from a pretest mean of 24.06 to a posttest mean of 29.38. (Appendixes include a list of articles used in the class and the Prior Knowledge Inventory.) (HOD)

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ED262384

Does Prior Knowledge Affect College Students' Performance on a State Developed Reading Competency Test?

College Reading Association

Pittsburgh, Pennsylvania

October 25, 1985

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Johnston (1983) has pointed out that current ways of assessing reading comprehension need to be reexamined in the light of recent research on schema theory (Langer, 1984; Langer & Smith-Burke, 1982; Mason, 1984; Wilson, 1983; Winograd & Newell, 1985). In a study of eighth-graders from rural and urban populations, Johnston (1984) found that prior knowledge influences comprehension and can be responsible for biasing the information gained from reading comprehension tests.

In Fall 1983, a study was conducted with college freshmen enrolled in a basic skills reading course to investigate the effects of background knowledge on the comprehension section of the Nelson-Denny Reading Test (N-D). The N-D includes eight passages selected from high school and college level materials representing the humanities, social sciences and natural and physical sciences.

Results indicated that the experimental group (exposed to articles based on topics found in the N-D) performed significantly better than the control group (exposed to articles on a variety of topics unrelated to the N-D).

The following question arose: Are all comprehension tests significantly biased by prior knowledge or only those containing text selected from specific academic areas?

In attempting to answer this question, a second study was conducted (Fall 1984) with the New Jersey College Basic Skills Test (NJCBSPT), a test which assesses students' ability to answer questions about passages on common, everyday topics, as the criterion measure.

PURPOSES OF STUDY

This present study proposed:

1. to determine the effects of direct exposure to the topics of the selections in the NJCBSPT on college students' post-test scores.
2. to investigate whether students exposed to the topics would indicate awareness of this knowledge on a teacher-made inventory.

SUBJECTS

The subjects were 33 college freshmen, 17 from one section and 16 from another section of Introduction to College Reading, a basic skills course. The two sections were randomly designated as the experimental or control group. These 33 students had raw scores below the state's suggested cut-off score on the reading comprehension section of the NJCBSPT. To be sure that the two sections were equal, their reading comprehension subtest scores on the N-D were subjected to t-test procedures. There was no statistically significant difference (Control: M=25.88, SD=7.86; Experimental: M=27.89, SD=8.55; $t_{32}=2.01$).

PROCEDURES

Both groups, taught by the same instructor, received the same syllabus with the same required texts and quizzes. The course organization was based on the framework of the text, Integrating College Study Skills (Sotiriou, 1984). In addition to weekly text assignments, supplementary articles were provided to reinforce the skill taught in the text (see Appendix A). The experimental group received articles on the topics

of the NJCBSPT; to control for the Hawthorne Effect the control group also received supplementary articles, similar in length and format, of everyday interest but unrelated to the test topics.

During the last week of class, both groups were given the Prior Knowledge Inventory (PKI) (see Appendix B) to assess students' awareness of topics on the NJCBSPT.

RESULTS

To see if there were any statistically significant differences related to the experimental treatment, the pre-test and post-test scores on the comprehension subtest of the NJCBSPT were subjected to a repeated measures analysis of variance (Sex x Treatment x Trials). The analysis of variance showed that only the main effects of sex and trials were significant (see Table 1). The males (M=29.46) did better than did the females (M=24.56) on the test despite condition or trial (see Table 2). While the experimental group went from a mean of 23.80 to a mean of 30.37 and the control group went from a mean of 25.51 to a mean of 28.40, the differences attributable to the main effect of treatment were not significant (see Table 3). The experimental group, which read pieces about the topics found in the NJCBSPT, did not do significantly better than did the control group which read only placebo pieces.

While the treatment variable did not affect the results, the reading program for both groups did show significant positive results. The total group went from a pretest mean of 24.06 to a post-test mean of 29.38

The total quantitative scores on the PKI were subjected to a two-way analysis of variance (sex x treatment). The analysis of variance

showed that only the main effect of treatment was significant ($p < .01$) (see Table 4). Students in the experimental group (M=31.79) thought that they knew significantly more about the topics than did those in the control group (M=26.10) (see Table 5).

DISCUSSION

Johnston (1983) classified prior knowledge into three categories: strategic knowledge, content or factual knowledge and metacognitive knowledge. The results of this study indicate that the NJCBSPT appears to test the student's ability to apply prior strategic knowledge (reading strategies) rather than the student's content or factual knowledge. Exposing the experimental group to the reading topics on the NJCBSPT did not enable them to do better than the controls on the post-test. However, since both the experimental and control group improved significantly (see Table3) on the NJCBSPT post-test after receiving direct instruction on study skills and exposure to large amounts of reading (articles, short stories and novels) in their reading course, these results appear to support the research (Fitzgerald & Spiegel, 1981; Brown et al., 1977) which indicates that the direct teaching of particular reading strategies through whole-text activities helps to improve strategic knowledge (Johnston, 1983).

Contrary to the results found with the N-D (a test which appears to measure what Johnston refers to as content or factual knowledge along with strategic knowledge), these results indicate that the topics used on the NJCBSPT are so general in nature that direct, intentional exposure to them will not affect test scores significantly. These topics appear to be more likely a part of the students' "shared common knowledge," picked up through television, newspapers, magazines, or general education.

The fact that the males in general did better than the females may be attributed to the limited sampling procedures used: only two sections, containing a total of 15 males were randomly selected for this study.

The PKI, a tool used to measure metacognition (Johnston's third type of prior knowledge), indicated that the students in the experimental group were significantly more aware of their knowledge about the topics on the NJCBSPT than were the students in the control group. However, this type of metacognition had no apparent effect on their test scores.

A similar inventory was used in the Fall, 1983, study with the N-D. Although the experimental group did not indicate significantly higher levels of awareness about the N-D topics than the control group, the experimental group did significantly better on the N-D test than the control group.

Both studies support the theory that students' awareness of their knowledge is not as important as the students' actual knowledge of the subject or their strategic knowledge.

IMPLICATIONS

Teachers and administrators should be aware of what a test is testing. Teachers should have this understanding in order to interpret the test results for placement and instructional purposes. Decisions about placement and instruction will be different for the student who lacks factual and content knowledge than it will be for the student who has not learned to employ efficient and effective reading strategies.

A test is useful only if the results can be interpreted in such a way that placement and instruction will be beneficial to the students.

TABLE 1

Analysis of Variance: Sex x Treatment x Trials
for
The New Jersey College Basic Skills Placement Test (NJCBSPT)

Source of Variation	Sum of Squares	Df	Mean Square	F Ratio	Significance
Sex	385.729	1	385.729	4.310	0.047
Treatment	0.277	1	0.277	0.003	0.500 over
Sex x Treatment	0.001	1	0.001	very small	
Unit	2595.664	29	89.506	not tested	
Trials	355.446	1	355.446	19.095	0.001 under
Treatment x Trials	54.050	1	54.050	2.904	0.100
Sex x Trials	0.628	1	0.628	0.034	0.500 over
Sex x Trials x Treatment	4.270	1	4.270	0.229	0.500 over
Trials x Unit	539.810	29	18.614	not tested	

TABLE 2

Means, Standard Deviations and Cell Frequency:

Main Effect of Sex on

The New Jersey College Basic Skills Placement Test (NJCBSPT)

		Experimental	Control	Total
Females	Mean	24.62	24.50	24.56 *
	S.D.	9.07	5.64	
	Number	8	10	18
Males	Mean	29.55	29.41	29.46 *
	S.D.	5.79	5.77	
	Number	9	6	15

*$p < .047$

TABLE 3

Means for All Cells:

Main Effect of Trials on

The New Jersey College Basic Skills Placement Test (NJCBSPT)

	Trial 1			Trial 2		
	Female	Male	Total	Female	Male	Total
Experimental (N = 17)	21.50	26.11	23.80	27.75	33.00	30.37
Control (N - 16)	22.70	28.33	25.51	26.30	30.50	28.40
Total (N = 33)	22.10	27.33	24.06*	27.02	31.75	29.38*

*$p < .001$

TABLE 4

Analysis of Variance:

Sex x Treatment for

Prior Knowledge Inventory (PK1)

Source of Variation	Sum of Squares	Df	Mean Square	F Ratio	Significance
Sex	7.055	1	7.055	0.204	Over 0.500
Treatment	257.729	1	257.729	7.436	0.011
Sex x Treatment	36.491	1	36.659	1.053	0.314
Unit	1005.102	29	34.659	not tested	

TABLE 5

Means for the Prior Knowledge Inventory (PKI):

Sex x Treatment

		Experimental	Control	Total
Females	Mean	30.250	26.700	28.475
	S.D.	6.274	6.430	
	Number	8	10	
Males	Mean	33.333	25.500	29.417
	S.D.	5.385	5.010	
	Number	9	6	
Total	Mean	31.792 *	26.100*	28.946

*$p < .01$

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Appendix A

ARTICLES FOR RESEARCH PROJECT
RLA 107 INTRODUCTION TO COLLEGE READING
Fall 1984

Chapter of Text	Experimental	Control
Chapter 3 Locating the Main Idea pg 33-54	"A Brief History of Astrology in the West", "Shakespeare's Artistic Use of Astrology", The Coffee Table Book of Astrology, John Lynch, Viking Press, Inc., New York, 1967, pp. 32-35, 257-258. "Heavens" New Yorker, Oct. 11, 1982, No. 58, pg. 39-40.	"Making Machines Fit People", Sharon Bagley, John Carey, Mary Bruno, Newsweek, August 29, 1983, Vol. 102, pg. 68. "Civil Rights: 20 Years Later", Bayard Rustin, Newsweek, August 29, 1983, Vol. 102, pg. 29.
Chapter 4 Locating Major and Minor Detail pg 55-76	"On Being Female", Being a Well Woman, Miriam Stoppard, Holt, Rinehart, and Winston, New York, 1982, pg. 8-9 "As More Men Learn 'To Think Like a Woman,' The Workplace Will Become A More Humane Place", Glamour, March 1983, Vol. 81, No. 99, pg. 92	"Unforgettable Donald Duck", Maurice Zolotow, Reader's Digest, May 1984, Vol. 124, No. 745, pg 112-116.
Chapter 5 Identifying Organizational Patterns pg 77-102	"Expanding the Kiddie Work Force" America, July 31, 1982, Vol. 147, pg 44. "Pro and Con 'Relax Rules on Hiring Teenagers?'", U.S. News & World Report, August 16, 1982, Vol. 93, pg 71-72.	"Network Reporting: Where the Bias Is" Edwin Diamond, Barry S. Suman, Jack Ling, T.V. Guide, July 7, 1984, pg 3-5. "In Enemy Water", Richard Shepard, The New York Times Magazine, July 1, 1984, Section 6, pp 34.
Chapter 6 Reading and Listening for Inferences	"Paterson", Encyclopedia of Jersey, Frank Gille, Beth Blenz, Timothy Gile, Somerset Publishers, New Jersey, 1983, pg. 198-199	"When 'Family' Will Have a New Definition", U.S. & World Report, May 9, 1983, Vol. 94, No. 18, pg. A3-A4.

Chapter 7 Reading Graphs and Tables pg. 117-132	"Can Phyllis Schlafly Sleep Easy At Last", Glamour, August 1982, Vol 82, pg 52. "Preface", Century of Struggle, Eleanor Flexner, The Belknap Press of Harvard University Press, Cambridge, Mass., pg. vii-x.	"...And Wee Willie Is Almost Two", People Weekly, June 25, 1984, Vol. 21, No. 84, pg. 34-35.
Chapter 8 Summarizing and Paraphrasing pg. 133-152	"The Conjurer's Art", "Prologue", Elements of Film, Lee R. Bobker, Harcourt, Brace, Jovanovich, Inc., New York, 1974, pg 2-7.	"A Stranger Comes Home", David Gelman, Newsweek, March 19, 1984, Vol. 103, pg 81.
Chapter 10 Traditional Notetaking Techniques pg. 167-196	"The Biggest", Birds Do the Strangest Things, Lenora and Arthur Hornblow, New York, Random House, 1965, 3-5. "Ostrich", A New Dictionary of Birds, Landsborough Thomson, McGraw-Hill Book Company, New York, 1964, pg 569-571. "He's Seven Feet, 300 Pounds But Oscar Is Not Just Big Bird II, He's Meaner Than Any Junkyard Dog", People's Weekly, Vol 20, pg 53, August 29, 1983, pg 53. (supplement)	"A Face That Really Launched 1,000 Ships and Many More", John Russell, Smithsonian, July 1984, Vol, 15, No 4, pg. 47-52.
Chapter 11 Alternate Note-taking Techniques pg 197-212	"Relationships and Distribution of Modern Birds", Finding Out About Birds, William C. Dilger, Parents' Magazine Press, New York, 1967, pg. 8-11. "Trees", Encyclopedia Americana (supplement), pg. 12-13. Grolier Inc.; Danbury, Conn., 1980, Vol. 27, pg 63.	"An Epizootic of Rabies", Alan M. Beck, Natural History, July 1984, Vol 93, No. 7, pg. 7-11. "These Days Animals Are Talking Like E.F. Hutton", Richard Walkomin, Smithsonian, August 1984, Vol 15, No 5, pg 140.
Chapter 12 The SQ3R Study System pg. 215-234	"Silver", Allen A. Boraiko, National Geographic, September 1981, Vol. 160 No. 3, pg 281-287. "Uses of Metals", "Silver", Metals, Lady Plowden, Molly Bearly, Asa Briggs, London: Mac Donald Educational, 1968, pg. 12, 46.	"A Splendid Light", Allen Boraiko, National Geographic, March 1984, Vol. 165, No. 3, pg 335-336. "Comeback for a National Symbol", Sharon Begley, Susan Agrest, Newsweek, July 9, 1984, Vol. 104, pg 64-65.

Chapter 13 Mnemonic Devices pg 237-248	"Titan", Tobias Owen, Scientific American, February 1982, Vol 246, pg 98. "What We've Learned About the Planets", U.S. & World Report, October 4, 1984, Vol. 93, pg 62-63.	"Mate Selection", Ian Robertson, Write to Read, Read to Write, Kathleen T. Mc Whorter, Candalene J. McCombs, Boston, Little, Brown, and Company, 1983, pg 65.
Chapter 14 Examination Strategies: Objective Tests pg. 249-265	"Breaking Through: Women on the Move", Mary Galligan, U.S. News & World Report, November 28, 1982, Vol 93, No. 22, pg 50-53.	"Alex Haley: From the Brink of Suicide to the Best Seller List", Mary Lang, Improving College Reading (3rd Edition), Lee A. Jacobus, Harcourt, Brace, Jovanovich, Inc., 1978, pg 35-38.
Chapter 15 Examination Strategies, Essay and Math or Science Tests pg 265-282	"Mental Illness", Encyclopedia Americana, Connecticut, Grolier, 1980, Vol. 18, pg. 701 "Taking Depression Seriously" Consumer's Research Magazine, Vol. 66, February 1983, pg. 36.	"Would American's Man Death Camps", Paul Galloway,, Reading and Other College Survival Skills (2nd Edition), Kendall, Hunt Publishing Company 1982, pg. 219-220.

Name _____

Date _____

Section _____

RLA 107 Introduction to College Reading

Check the category which describes the amount of knowledge you have about the following topics:

		Great Deal	Moderate	Minimum	None
1.	History of Women's Rights	___	_____	_____	_____
2.	Paterson Silk Mill Strike	___	_____	_____	_____
3.	The Causes of Gastronology	___	_____	_____	_____
4.	Bird and Tree Classifications	___	_____	_____	_____
5.	Child Labor	___	_____	_____	_____
6.	Treatment of Mental Illness	___	_____	_____	_____
7.	The Effects of Films	___	_____	_____	_____
8.	Different Uses of Metals	___	_____	_____	_____
9.	Ostriches	___	_____	_____	_____
10.	Garbology	___	_____	_____	_____
11.	Female Conditioning	___	_____	_____	_____
12.	The Characteristics of Bazelles	___	_____	_____	_____
13.	Female Leadership in the 80's	___	_____	_____	_____
14.	Shakespeare's Madness at Midnight	___	_____	_____	_____
15.	Saturn's Satellite, Titan	___	_____	_____	_____
16.	Use of Astrological Language in the Past	___	_____	_____	_____